BPS 101-1:1 Pilot Learning Report
“We could study things we liked and things we were interested in because it was like being in the computer lab and the library every day.”
The 4Cs serve as foundational skills in the 21st century. To adequately teach these skills, however, we must rethink our traditional instructional strategies. Instructional technology cannot be treated as a separate initiative -- yet another thing for students and teachers to master. It is a tool that must be strategically employed and integrated into learning.

Nor do we want to integrate technology simply for the sake of innovation; instead, we are searching for and experimenting with meaningful uses of technology that enhance teaching and learning to (i) engage students, (ii) empower teachers, (iii) and build a flexible learning environment.

Workforce skills and demands have changed dramatically in the past 40 years. Students today need different skills to succeed in our new, global economy. We face nothing less than a fundamental, cultural shift in our expectations of education and the competencies of our graduates. In addition to the traditional 4Rs, we now strive to teach the 4Cs:

- Critical thinking
- Communication
- Collaboration
- Creativity
Innovative Teaching and Learning (ITL Research)
Sponsored by Microsoft Partners in Learning, this research is based on school leader and educator surveys for a multinational study focused on measuring and developing 21st Century teaching and learning. The emphasis is on student-centered pedagogy, extending learning beyond the classroom, and overall use of instructional technology.

Project RED The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness
The Project RED study shows that the lower the student-computer ratio, the greater the individualization of instruction and the more students take responsibility for their learning. Eighty-eight percent of respondents say that teachers in 1:1 classrooms spend more time on individual and small-group instruction and seventy-five percent say that students in 1:1 environments take control of their own learning.

Charting the Path from Engagement to Achievement: HSSSE
HSSSE is a five program study that charts the connection between student engagement and achievement. The primary purpose of the project is to help high schools explore, understand, and strengthen student engagement. The survey is the central component of a research and professional development project directed by the Center for Evaluation & Education Policy (CEEP) at Indiana University and is designed to investigate the attitudes, perceptions, and beliefs of high school students.

The Digital Learning Imperative: How Technology and Teaching Meet Today’s Education Challenges
The Digital Learning Imperative report outlines how digital learning can connect middle and high school students with better teaching and learning experiences while also addressing three major challenges facing the nation’s education system -- access to good teaching, tight budgets, and boosting student achievement. But simply slapping a netbook on top of a textbook will not lead to improvements. Effective educational technology strategies must link the "Three Ts"--teaching, technology, and use of time -- with overall whole-school reform strategies and proven pedagogical practices to accelerate the pace of improvement and ensure that all students benefit from the opportunity that digital learning offers.
Pilot Study Approach

The focus of this study was to examine the impact upon the learning experience when students have their own, personal device at school.

Theory of Action
If students have their own, personal device (i.e., iPad or Chromebook) at school; and if teachers are able to leverage such devices to enhance instructional strategies that enable students to have more personalized learning experiences (voice and choice); and if individualized and/or personalized learning improves student engagement; then engaged students will demonstrate higher levels of achievement.

Research Questions
Technology has extraordinary, and mostly untapped, potential to transform education. To explore this potential, we have framed our inquiry with the SAMR model of technology integration developed by Dr. Ruben Puenteledra.
As we explore the impact of technology and 1:1 devices on teaching and learning, we ask the following questions:

• Does it make learning more efficient? (enhancement)
• Does it alter past learning experience for the better? (enhancement or transformative)
• Does it create meaningful learning experience not otherwise possible? (transformative)

Framed by the SAMR model, the following charges were drivers for our pilot experiment:

• Investigate the impact of a personal learning device on student agency and engagement.
• Explore the pedagogical strategies made available through 1:1 access to a personal device in the classroom.
• Explore differences in the classroom experience and learning environment.
“We had these blogs, and we got to share our ideas about books or other things with people we wouldn’t have had a chance to talk to in school otherwise.”
Data Gathering

The following are the data gathering methods used to address the aforementioned research questions.

- Successive surveys
- Interviews/ focus groups

Approach

Microsoft PILSR (Partners in Learning School Research) Survey

This survey measures participants’ reports of innovative teaching practices in the school, including the use of technology for learning and school support for innovative practices. The goal of the research is to provide tools for schools to measure and develop innovative teaching and learning, and to ultimately better prepare students for life and work in the 21st century. The survey data reported in this document focuses on measuring key elements of the ITL Research Model, including the extent of Innovative Teaching Practices educators use.

A baseline PILSR survey was administered at each of the district buildings. Baseline data from Rotolo Middle School and Alice Gustafson Elementary School was used as a comparison against administration of the survey with 1:1 teacher participants in the spring of each school year.
Interviews with focus groups were utilized as a tool to gain insight into the experiences of student and staff participants. Teacher participants were interviewed and students participants were randomly chosen based on samplings from the following groups:

- AGS pilot participants who are now RMS pilot participants
- AGS pilot participants who are not RMS pilot participants
- RMS pilot participants

Focus group questions:

- Was learning with the “device” enjoyable for you?
- How did you do things differently in class with the devices compared to without?
- What were some of the activities you were able to do because you had the devices?
- Did you learn anything new or get better at anything?
- Did you like having the devices in class? Why or why not?
- What technology skills do you think are important to develop?
- Was the work easier or harder? Did you have to concentrate more?
- Were you given choices about how to complete assignments? Examples
- (If applicable) What is it like now that you do not have a device? Is learning easier, harder?
- (If applicable) What is the difference between the iPad and Chromebook? Which do you prefer
“With the Chromebook, everyone could finish at different times and it was okay. The whole class didn’t have to stay together. If I was behind, I could just keep working at my own pace.”
Findings - Student Engagement

Student engagement

Student engagement is difficult to describe and quantify. Perhaps the best definition comes from the work of Phil Schlecty (1994), who says students who are engaged exhibit three characteristics: (1) they are attracted to their work, (2) they persist in their work despite challenges and obstacles, and (3) they take visible delight in accomplishing their work. Student agency, voice and choice, directly impacts student participation and investment in the lesson and is an indicator of engagement. A 1:1 technology initiative is not about the device as much as it is about the opportunity to teach students to use tools and technology to seek answers and synthesize information to make learning relevant as they interact with the content and learn critical 21st century skills.

The key components for improving student engagement are:

- Personalized learning
- Self-regulation (pacing, agency)
- Collaboration

Other related research demonstrates that innovative teaching practices are strongly associated with students' development of 21st century skills (see www.itlresearch.com).
Findings - Student Engagement

This table shows how pilot teachers use key elements of innovative teaching practices that impact student engagement.

<table>
<thead>
<tr>
<th>Allow students to choose their own topics of learning or questions to pursue</th>
<th>AGS Baseline</th>
<th>Pilot</th>
<th>RMS Baseline</th>
<th>Pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10%</td>
<td>100%</td>
<td>21%</td>
<td>100%</td>
</tr>
<tr>
<td>Allow students to choose how they will accomplish a task or demonstrate what they have learned</td>
<td>30%</td>
<td>67%</td>
<td>29%</td>
<td>100%</td>
</tr>
<tr>
<td>Provide students opportunity to work at their own pace</td>
<td>95%</td>
<td>100%</td>
<td>89%</td>
<td>100%</td>
</tr>
<tr>
<td>Select topics relevant to life outside of school</td>
<td>70%</td>
<td>100%</td>
<td>68%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*% Educators who ask students to do this at least 1-3 times per month
“I could really easily explain my thinking. Like with a math problem, I could talk about my learning and thinking while showing it and recording it in ScreenChomp. That way I could share my thinking with my teacher or even with my classmates really easily.”

“Now I know I have lots of options. It seems like without technology that someone is holding you back.”
“I got a lot better at research. You learned how to use the tools, like the research tools over on the side to cite things and everything. When we used to use the computer lab, we would go over how to write a paper a little, but when we had more time, we were able to get a better understanding.”
Empowering Teachers

Technology is embedded in all facets of life, and education must reflect this fact. To keep pace with an evolving culture, teachers must utilize technology to enhance effective teaching and extend learning beyond the classroom. With technology, teachers will be empowered to better identify student needs and support personalized instruction to maximize student learning. Emerging research encourages teachers and other educational stakeholders to a) focus on real-world problems and processes, b) support inquiry-based learning experiences, c) provide opportunities for collaborative project approaches to learning, d) and focus on teaching students how to learn above “what” to learn (Pacific Policy Research Center. 2010. 21st Century Skills for Students and Teachers)

The key components for empowering better instructional practice are:

- Collaboration
- Knowledge building
- Technology use (teachers and students)
This table shows how frequently pilot teachers report using key student-centered pedagogical practices.

<table>
<thead>
<tr>
<th>Activity</th>
<th>AGS Baseline</th>
<th>AGS Pilot</th>
<th>RMS Baseline</th>
<th>RMS Pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student use of technology to work with students or adults from outside the class</td>
<td>12%</td>
<td>100%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Teachers use technology to monitor pre-determined learning goals</td>
<td>65%</td>
<td>100%</td>
<td>80%</td>
<td>67%</td>
</tr>
<tr>
<td>Students use technology to write or edits stories, reports or essays</td>
<td>35%</td>
<td>100%</td>
<td>52%</td>
<td>100%</td>
</tr>
<tr>
<td>Students use technology to analyze data or information</td>
<td>24%</td>
<td>100%</td>
<td>16%</td>
<td>67%</td>
</tr>
</tbody>
</table>

* Educators who say they or their students do this at least 1-3 times per month

* we attribute the lack of growth in some areas at RMS to the short period of time for pilot implementation
“I can’t imagine not having one-to-one devices. It has literally changed the way I teach....I have been able to do so much more, and I feel like my students have been able to have a richer experience and have learned to access the resources they need to empower their own learning. Students have become self-directed learners with the resources to enhance their own learning with teachers to guide them in creation, communication, evaluation, etc. in a real-world setting. (And we REALLY believe that! I used to think in terms of apps, and now I think in terms of the skills kids need to be successful lifelong learners.)”
Engaged students and empowered teachers interact in the learning environment to facilitate student growth. Technology can create a flexible learning environment that extends beyond the walls of the school, allowing students and teachers to communicate and collaborate anytime and anywhere. Access to a technology rich environment enables teachers to address a variety of student needs and adapt instruction to maximize learning.

The key components for building a flexible learning environment are:

- Extended classroom community
- Global awareness
This table shows how teachers report using key practices that extend learning beyond the classroom and promote global awareness.

<table>
<thead>
<tr>
<th></th>
<th>AGS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
</tr>
<tr>
<td>Work with peers from outside the school</td>
<td>10%</td>
</tr>
<tr>
<td>Produce something for use outside of the classroom</td>
<td>5%</td>
</tr>
<tr>
<td>Study information about other countries or cultures</td>
<td>10%</td>
</tr>
<tr>
<td>Study issues directly relevant to their family or community</td>
<td>20%</td>
</tr>
</tbody>
</table>

*% Educators who say they or their students do this at least 1-3 times per month

* the RMS pilot duration is insufficient to include valid data
“You have to know how to connect to other people, like through email or Skype or blogs. You might want to send messages to family or pen pals or use it for other things, and you have to know how to do those things.”

“We had these blogs, and we got to share our ideas about books or other things with people we wouldn’t have had a chance to talk to in school otherwise.”

We were able to learn how to communicate with other people who weren’t in our class. We talked to people in Turkey and had to learn to phrase things from their perspective and to use simple words so they could understand us.”
Recommendations

Thus far, the 1:1 pilot has generated significant interest and excitement among students and teachers. Most participants have remarked that, after their experience, they would never want to go without their own device. Preliminary findings indicate that the pilots have had a positive influence on indicators for 21st century learning and innovative teaching practices. While the impact on student achievement is unclear, its influences will always be indirect and difficult to measure.

Considering these findings, we recommend:

- Continue to provide support for professional learning through professional development and instructional coaching.
- Interviews/ focus groups
- Expansion of the 1:1 pilot to all 6th grade students at Rotolo Middle School
- Implementation of a 1:1 pilot with kindergarten students to explore the influence of 1:1 at the primary level